

IN THE CLAIMS

1. (Currently Amended) A semiconductor substrate processing apparatus comprising:
a frame;
a semiconductor substrate support to support a semiconductor substrate, the semiconductor substrate having a central axis;
a dispense head connected to the frame to dispense a semiconductor processing fluid onto the semiconductor substrate; and
a catch cup section attached to the frame having an inner surface and an outer surface, at least a portion of the inner surface not facing towards the central axis of the semiconductor substrate, wherein the catch cup further comprises a lip extending from the inner surface thereof towards the central axis of the semiconductor substrate, and wherein the lip is angled such that an inner portion of an upper surface of the lip is higher than an outer portion of the upper surface of the lip, and wherein the lip comprises a top lip having an inner tip curving downward toward a plane of the semiconductor substrate support.
2. (Original) The semiconductor substrate processing apparatus of claim 1, wherein a line normal to and extending only away from the portion of the inner surface does not intersect the central axis of the semiconductor substrate.
3. (Canceled)
4. (Previously Presented) The semiconductor substrate processing apparatus of claim 2, wherein the lip further comprises an upper surface and a lower surface, at least a portion of the upper surface of the lip facing away from the central axis of the semiconductor substrate.

5. (Original) The semiconductor substrate processing apparatus of claim 4, wherein a line normal to and extending only away from the portion of the upper surface of the lip does not intersect the central axis of the semiconductor substrate.
6. (Original) The semiconductor substrate processing apparatus of claim 5, wherein at least a portion of the lower surface of the lip faces away from the central axis of the semiconductor substrate.
7. (Original) The semiconductor substrate processing apparatus of claim 6, wherein a line normal to and extending only away from the portion of the lower surface of the lip does not intersect the central axis of the semiconductor substrate.
8. (Original) The semiconductor substrate processing apparatus of claim 7, wherein the catch cup further comprises at least two drain openings and a passageway therethrough interconnecting the at least two drain openings.
9. (Previously Presented) A semiconductor substrate processing apparatus comprising:
a frame;
a semiconductor substrate support to support a semiconductor substrate, the semiconductor substrate having a central axis;
a dispense head connected to the frame to dispense a semiconductor processing fluid onto the semiconductor substrate; and

a catch cup section attached to the frame having an inner surface and an outer surface, at least a portion of the inner surface not facing towards the central axis of the semiconductor substrate;

wherein a line normal to and extending only away from the portion of the inner surface does not intersect the central axis of the semiconductor substrate,

wherein the catch cup further comprises a lip extending from the inner surface thereof towards the central axis of the semiconductor substrate,

wherein the lip further comprises an upper surface and a lower surface, at least a portion of the upper surface of the lip facing away from the central axis of the semiconductor substrate,

wherein a line normal to and extending only away from the portion of the upper surface of the lip does not intersect the central axis of the semiconductor substrate

wherein at least a portion of the lower surface of the lip faces away from the central axis of the semiconductor substrate,

wherein a line normal to and extending only away from the portion of the lower surface of the lip does not intersect the central axis of the semiconductor substrate,

wherein the catch cup further comprises at least two drain openings and a passageway therethrough interconnecting the at least two drain openings, and

wherein a first of the drain openings is on the inner surface of the catch cup above the lip and a second of the drain opening is on the inner surface of the catch cup below the lip such that a liquid on the upper surface of the lip flows into the first drain opening, through the passageway, and out of the second opening.

10. (Original) The semiconductor substrate processing apparatus of claim 9, wherein an upper surface of the semiconductor substrate is in a plane, an inner portion of the upper surface of the lip being a first height above the plane, an outer portion of the upper surface of the lip being a second height above the plane, the first height being greater than the second height.

11. (Original) The semiconductor substrate processing apparatus of claim 10, wherein the semiconductor substrate is a wafer.

12. (Currently Amended) A semiconductor substrate processing apparatus comprising:

a frame;

a semiconductor substrate support to support a semiconductor substrate, the semiconductor substrate having a central axis;

a dispense head connected to the frame to dispense a semiconductor processing fluid onto the semiconductor substrate; and

a catch cup section attached to the frame around the semiconductor substrate support and having an upper surface, substantially all of the upper surface either facing towards or away from the central axis of the semiconductor substrate, wherein the catch cup further comprises a lip extending from the inner surface thereof towards the central axis of the semiconductor substrate, and wherein the lip is angled such that an inner portion of an upper surface of the lip is higher than an outer portion of the upper surface of the lip, and wherein the lip comprises a top lip having an inner tip curving downward toward a plane of the semiconductor substrate support.

13. (Original) The semiconductor substrate processing apparatus of claim 12, wherein the semiconductor substrate has a surface in a plane.
14. (Original) The semiconductor substrate processing apparatus of claim 13, wherein substantially all of the catch cup section is below the plane.
15. (Original) The semiconductor substrate processing apparatus of claim 14, wherein substantially no portion of the upper surface of the catch cup is parallel to the plane.
16. (Original) The semiconductor substrate processing apparatus of claim 15, wherein the catch cup section further comprises a peak formation extending upwards from the upper surface thereof, the peak formation dividing the upper surface into inner and outer portions, the inner portion of the upper surface facing towards the central axis of the semiconductor substrate, the outer portion of the upper surface facing away from the central axis of the semiconductor substrate.
17. (Original) The semiconductor substrate processing apparatus of claim 16, wherein a line normal to and extending only away from the inner portion of the upper surface of the catch cup intersects the central axis of the semiconductor substrate and a line normal to and extending only away from the outer portion of the upper surface of the catch cup does not intersect the central axis of the semiconductor substrate.
18. (Previously Presented) A semiconductor substrate processing apparatus comprising:
a frame;

a semiconductor substrate support to support a semiconductor substrate, the semiconductor substrate having a central axis;

a dispense head connected to the frame to dispense a semiconductor processing fluid onto the semiconductor substrate; and

a catch cup section attached to the frame around the semiconductor substrate support and having an upper surface, substantially all of the upper surface either facing towards or away from the central axis of the semiconductor substrate; and

wherein the semiconductor substrate has a surface in a plane,

wherein substantially all of the catch cup section is below the plane,

wherein substantially no portion of the upper surface of the catch cup is parallel to the plane,

wherein the catch cup section further comprises a peak formation extending upwards from the upper surface thereof, the peak formation dividing the upper surface into inner and outer portions, the inner portion of the upper surface facing towards the central axis of the semiconductor substrate, the outer portion of the upper surface facing away from the central axis of the semiconductor substrate,

wherein a line normal to and extending only away from the inner portion of the upper surface of the catch cup intersects the central axis of the semiconductor substrate and a line normal to and extending only away from the outer portion of the upper surface of the catch cup does not intersect the central axis of the semiconductor substrate, and

wherein the semiconductor substrate has an outer edge and a peak of the peak formation is substantially directly below the outer edge of the semiconductor substrate.

19. (Original) The semiconductor substrate processing apparatus of claim 18, wherein the catch cup section further comprises at least two drain openings and a passageway therethrough interconnecting the drain openings.

20. (Original) The semiconductor substrate processing apparatus of claim 19, wherein a first of the drain openings is on the inner portion of the upper surface of the catch cup section and a second of the drain openings is on the outer portion of the upper surface of the catch cup section such that a liquid on the inner portion of the upper surface of the catch cup section flows into the first drain opening, through the passageway, and out of the second drain opening.

21. (Currently Amended) A semiconductor substrate processing apparatus comprising:

a frame;

a semiconductor substrate support to support a semiconductor substrate, the semiconductor substrate having a central axis;

a dispense head connected to the frame to dispense a semiconductor processing fluid onto the semiconductor substrate; and

a catch cup having a mid-section and a top section, the mid-section being attached to the frame around the semiconductor substrate support and having a top surface, substantially all of the top surface either facing towards or away from the central axis of the semiconductor substrate, the top section being attached to the frame around the mid-section and having an inner surface and an outer surface, at least a portion of the inner surface facing away from the central axis of the semiconductor substrate,

wherein the top section of the catch cup further comprises a lip extending from the inner surface thereof towards the central axis of the semiconductor substrate, and wherein the lip is angled such that an inner portion of an upper surface of the lip is higher than an outer portion of the upper surface of the lip, and wherein the lip comprises a top lip having an inner tip curving downward toward a plane of the semiconductor substrate support.

22. (Original) The semiconductor substrate processing apparatus of claim 21, wherein the semiconductor substrate has a surface in a plane.

23. (Original) The semiconductor substrate processing apparatus of claim 22, wherein substantially no portion of the top surface of the mid-section of the catch cup is parallel to the plane.

24. (Original) The semiconductor substrate processing apparatus of claim 23, wherein a line normal and extending only away from the portion of the inner surface of the top section does not intersect the central axis of the semiconductor substrate.

25. (Canceled)

26. (Currently Amended) The semiconductor substrate processing apparatus of claim [[25]] 24, wherein the mid-section of the catch cup further comprises a peak formation extending upwards from the top surface thereof, the peak formation dividing the top surface into inner and outer portions.

27. (Original) The semiconductor substrate processing apparatus of claim 26, wherein the lip of the top section of the catch cup further comprises an upper surface and a lower surface, at least a portion of the upper surface of the lip facing away from the central axis of the semiconductor substrate.

28. (Original) The semiconductor substrate processing apparatus of claim 27, wherein the inner portion of the top surface of the mid-section faces towards the central axis of the semiconductor substrate and the outer portion of the top surface of the mid-section faces away from the central axis of the semiconductor substrate.

29. (Original) The semiconductor substrate processing apparatus of claim 28, wherein a line normal and extending only away from the upper surface of the lip does not intersect the central axis of the semiconductor substrate.

30. (Original) The semiconductor substrate processing apparatus of claim 29, wherein a line normal to and extending only away from the inner portion of the top surface of the mid-section of the catch cup intersects the central axis of the semiconductor substrate and a line normal to and extending only away from the outer portion of the top surface of the mid-section of the catch cup does not intersect the central axis of the semiconductor substrate.

31. (Original) The semiconductor substrate processing apparatus of claim 30, wherein at least a portion of the lower surface of the lip of the top section of the catch cup faces away from the central axis of the semiconductor substrate.

32. (Original) The semiconductor substrate processing apparatus of claim 31, wherein a line normal to and extending only away from the lower surface of the lip of the top section of the catch cup does not intersect the central axis of the semiconductor substrate.

33. (Previously Presented) A semiconductor substrate processing apparatus comprising:
a frame;

a semiconductor substrate support to support a semiconductor substrate, the semiconductor substrate having a central axis;

a dispense head connected to the frame to dispense a semiconductor processing fluid onto the semiconductor substrate; and

a catch cup having a mid-section and a top section, the mid-section being attached to the frame around the semiconductor substrate support and having a top surface, substantially all of the top surface either facing towards or away from the central axis of the semiconductor substrate, the top section being attached to the frame around the mid-section and having an inner surface and an outer surface, at least a portion of the inner surface facing away from the central axis of the semiconductor substrate;

wherein the semiconductor substrate has a surface in a plane;

wherein substantially no portion of the top surface of the mid-section of the catch cup is parallel to the plane;

wherein a line normal and extending only away from the portion of the inner surface of the top section does not intersect the central axis of the semiconductor substrate;

wherein the top section of the catch cup further comprises a lip extending from the inner surface thereof towards the central axis of the semiconductor substrate;

wherein the mid-section of the catch cup further comprises a peak formation extending upwards from the top surface thereof, the peak formation dividing the top surface into inner and outer portions;

wherein the lip of the top section of the catch cup further comprises an upper surface and a lower surface, at least a portion of the upper surface of the lip facing away from the central axis of the semiconductor substrate;

wherein the inner portion of the top surface of the mid-section faces towards the central axis of the semiconductor substrate and the outer portion of the top surface of the mid-section faces away from the central axis of the semiconductor substrate;

wherein a line normal and extending only away from the upper surface of the lip does not intersect the central axis of the semiconductor substrate;

wherein a line normal to and extending only away from the inner portion of the top surface of the mid-section of the catch cup intersects the central axis of the semiconductor substrate and a line normal to and extending only away from the outer portion of the top surface of the mid-section of the catch cup does not intersect the central axis of the semiconductor substrate;

wherein at least a portion of the lower surface of the lip of the top section of the catch cup faces away from the central axis of the semiconductor substrate;

wherein a line normal to and extending only away from the lower surface of the lip of the top section of the catch cup does not intersect the central axis of the semiconductor substrate; and

wherein the semiconductor substrate has an outer edge and a peak of the peak formation is substantially directly below the outer edge of the semiconductor substrate.

34. (Original) The semiconductor substrate processing apparatus of claim 33, wherein the mid-section of the catch cup further comprises first and second mid-drain openings and a mid-passageway therethrough interconnecting the first and second mid-drain openings.

35. (Original) The semiconductor substrate processing apparatus of claim 34, wherein the top section of the catch cup further comprises first and second top-drain openings and a top-passageway therethrough interconnecting the first and second top-drain openings.

36. (Original) The semiconductor substrate processing apparatus of claim 35, wherein the first mid-drain opening is on the inner portion of the top surface of the mid-section of the catch cup and the second mid-drain opening is on the outer portion of the top surface of the mid-section of the catch cup such that a liquid on the inner portion of the top surface of the mid-section of the catch cup flows into the first mid-drain opening, through the mid-passageway, and out of the second mid-drain opening.

37. (Original) The semiconductor substrate processing apparatus of claim 36, wherein the first top-drain opening is on the inner surface of the top section of the catch cup above the lip and the second top-drain opening is on the inner surface of the top section of the catch cup below the lip such that a liquid on the upper surface of the lip flows into the first top-drain opening, through the top-passageway, and out of the second opening.